

**REMARKS**

This is in response to the non-final Official Action currently outstanding with regard to the present application.

Claims 1, 3-13 and 17-18 were present in this application as of the time of the issuance of the currently outstanding Official Action. Claims 1, 3-13 and 17-18 currently stand rejected by the Examiner. Applicants request the entry of the foregoing Amendment of Claim 10 for the purpose of correcting a minor typographical error therein. Applicants do not request by the foregoing Amendment that any Claims be added, canceled or withdrawn. Accordingly, upon the entry to the foregoing Amendment, Claims 1, 3-13 and 17-18, as amended above, will constitute the Claims under active prosecution in this application.

The claims of this application are reproduced above including appropriate status identifiers and showing the Amendments sought as required by the Rules.

More particularly, in the currently outstanding Official Action the Examiner has:

1. Acknowledged Applicants' claim for foreign priority under 35 USC §119 (a)-(d) or (f), and confirmed the receipt of the required copies of the priority documents by the United States Patent and Trademark Office;
2. Failed to acknowledge the acceptability of the Request for Drawing Change as filed with Applicants' Amendment After Final Rejection on 3 July 2008 – **Applicants assume that the Examiner's failure to comment upon the replacement drawings filed was an oversight and respectfully request formal acceptance of the drawings as they now stand in response to this communication;**

3. Acknowledged the Request for Continued Examination filed on 27 August 2008;
4. Rejected Claim 1, 3-13 and 17-18 under 35 USC §103(a) as being unpatentable over Tominaga et al. (US Patent No. 5,569,517) and further in view of Jung (US Patent No. 5,516,568);

No further comment regarding items 1-3 above is deemed to be required in these Remarks.

The Examiner now has revised his previous position regarding the application such that all of the pending claims are rejected as being obvious within the meaning of 35 USC 103(a), instead of some being unpatentable under 35 USC 103(a) while others were anticipated within the meaning of 35 USC 102. Nevertheless, the Examiner's present rejections appear to be based upon the same erroneous reasoning as heretofore and consequently Applicants respectfully traverse the same and respectfully request reconsideration.

In support of this request for reconsideration, Applicants respectfully repeat certain of the arguments made in their last Amendment as follows:

With respect to then currently outstanding rejections under 35 USC 112, Applicants in their last Amendment added the following wording to the claims:

- (1) the reproducing layer be described in the claims as "a reproducing layer for improving the resolution of optical signals from said pits and passing said improved resolution optical signals from said pits to said optical system; and
- (2) the resolution limit be described in the claims as "a resolution limit of an optical system of a reproducing apparatus which reproduces that optical data recording medium.

Applicants' then argued that these amendments removed the bases for the then currently outstanding rejections under 35 USC 112 not only because it is apparent that the Examiner apparently inadvertently misunderstood the nature of the reproducing layer (as being a recording layer) when he last examined the claims of this application, but also because the function of the reproducing layer is more clearly and definitively stated in the above amended claims than heretofore. Furthermore, the nature of the optical resolution limit set forth in the claims was clarified by the foregoing Amendment.

Accordingly, Applicants adopted the approach that there is going to be a reproducing apparatus that characteristically will have a resolution limit that will appropriately record information to and reproduce information from a disk having pits of a particular dimension and that that device may be characterized simply as "a reproducing apparatus which reproduces the optical data recording medium" without the necessity of more specificity. Having determined that, it then became straightforward to define the reproducing layer in terms of its creation and passing of signals having improved resolution over that achieved by the basic reproducing apparatus.

Moreover, Applicants noted that in comparing Claim 1 of the present application with the Tominaga et al reference, the Examiner had asserted that the protective layer 10 of Tominaga et al. corresponds to the substrate of claim 1. In response, it was noted, however, that Tominaga et al. includes a substrate 2 separately from the protective layer 10. Applicants respectfully submit in this regard that it is the substrate 2 that the Examiner should regard as corresponding to the substrate of claim 1 in his comparisons of the present claims with the Tominaga et al reference and that when the correct comparison is made in view of the foregoing discussion it is apparent that this application is neither anticipated nor unpatenatably obvious over the art currently relied upon by the Examiner.

In the latter regard, Applicants submitted that in the field of the optical data recording mediums it is so well known as to require no further support in these Remarks that what is termed as being a "substrate" is clearly distinct from what is termed as "protective layer".

Therefore, Applicants submitted that the Examiner continued to characterize both the elements 10 and 21 of FIG. 2 of the Tominaga reference as being “a substrate having pits”. However, the substrate is clearly indicated at 2 and the pits are clearly indicated at 21 (see Tominaga at Column 4, lines 18-22). Further, there is no indication that irregularities depicted in the drawings on the inwardly facing surface of the protective layer 10 in any way are (or can be) used to store information in a manner analogous to that utilized with respect to the pits. Still further, contrary to the Examiner’s assertion, it appeared that while the substrate 2 and the protective layer 10 are to be formed of less heat resistant resins than the mask layer 32 and can be deformed (see Tominaga et al at Column 7, lines 44-47), the substrate and the protective layer are not disclosed as being formed of the same material as the Examiner had suggested.

Furthermore, Applicants previously have agreed that as has been suggested the Tominaga et al. reference, in Figures 1 and 2, shows pits 21 shorter than the diameter  $\phi_o$  of a reading light beam. Nevertheless, Applicants also have submitted however that this is insufficient to anticipate the feature of the amended claims that specifies “pits disposed on a light incident surface thereof, corresponding to the recorded data, which are shorter than a resolution limit of an optical system of a reproducing apparatus which reproduces the optical data recording medium”.

The beam spot diameter in devices of the type herein claimed is generally and conventionally denoted by those skilled in the art as  $\lambda/NA$  ( $\lambda$ : being the wavelength of read light beam, and NA being the numerical aperture). In contrast, the typical optical resolution limit is generally denoted by  $\lambda/(4NA)$ , that is as being equal to one quarter (1/4) of the beam spot diameter. Accordingly, when one skilled in the art views the pits shown in Figures 1 and 2 of Tominaga et al. bearing the foregoing facts in mind, it clearly appears that the pits depicted by Tominaga et al are longer than the optical resolution limit referred to in the claims as discussed hereinabove. In this regard it also is to be recognized that the Tominaga et al. reference does not explicitly teach pits shorter than the resolution limit of an optical system of an associated reproducing apparatus.

Indeed, the Examiner previously in this prosecution has admitted that the Tominaga reference does not teach that the pits are less than the optical resolution limit as calculated by  $\lambda/(4NA)$ , but nevertheless maintained that one of ordinary skill in the art would understand that Tominaga is teaching pits shorter than the normal optical resolution limit by inference from the sections at Column 2, lines 24-35 and Column 10, lines 7-20 of the Tominaga et al specification. The Examiner has based (and still bases) the foregoing position upon an unsupported belief that the only variable that accounts for the changes in super resolution as discussed by the Tominaga et al reference is changes in pit length thereby making the presently claimed pit lengths inherent in the Tominaga et al disclosure. Applicants again cannot agree.

In particular, it is to be recognized that the Tominaga et al reference does not characterize the prior art referred to in the Background section of his specification in the manner referred to above because that art is different from and not relevant to the Tominaga Fig. 2 invention. Hence, while the materials referred to by Tominaga at Col. 2, lines 24-35 are suggested to achieve higher resolutions than the resolution limit of the associated optical system, those materials are different from the materials that Tominaga et al discusses with respect to his Fig. 2 and never quantify the length of the phase pits referred to as being optically read. Hence, Applicants respectfully submit that while Tominaga may indicate generally that reproducing layers are present in the art that can improve the resolution of information derived from pits in a substrate surface, nothing in Column 2, lines 24-35 of Tominaga is sufficient to anticipate (or render obvious) the present invention because there is no disclosure, teaching or suggestion regarding the length of the so-called "phase pits" relative to the optical resolution limit of the optical system provided by the Tominaga et al reference in this (or indeed any) regard.

The same is true with respect to the Examiner's comment that "super resolution is the ability to read an image beyond the diffraction limit resolution". In other words, without any specification teaching, disclosing or suggesting the specific quantitative relationship between the optical system resolution and the length of the pits, it is not possible to justify a position that the Tominaga et al reference anticipates the present claims that do specify the quantitative relationship not disclosed by Tominaga, et al.

In this regard as well, Applicants respectfully submit that it should be recognized that the Tominaga et al reference specifically refers only to a suggestion that the results of at least one of the experiments described in his specification is that a higher resolution is achievable with a material that changes its reflectance with temperature. Applicants submit, however, that the latter comment by Tominaga et al, even if true, is not sufficient to justify the expansive conclusions concerning the relationships between pit length and optical system resolution that the Examiner has chosen to draw from it. Hence, it is Applicants' position that neither of the portions of the Tominaga et al reference referred to by the Examiner is sufficient to constitute a reduction to practice by Tominaga, et al of the super resolution disclosed and claimed in this application and further that accordingly the Examiner has not justified a conclusion of anticipation based thereon.

Moreover, Tominaga et al does not inherently teach, disclose or suggest to one skilled in the art that so-called "super resolution" technology delivers a desired performance when the length of the pits that are the signal source are at or below the optical resolution limit of the associated optical system. The Tominaga et al reference's broad and generalized suggestion that it achieves a higher resolution limit than the optical resolution limit of the associated optical system does not constitute a teaching, disclosure or suggestion that that higher resolution limit originates only and/or necessarily with signals reproduced from pits shorter than the resolution limit of the optical system.

Hence, while the Tominaga et al reference may suggest that it obtains a higher resolution than the optical resolution of its associated optical system, that suggestion alone and taken only in and of itself cannot be taken as a disclosure that the Tominaga results are achieved with pit lengths shorter (or for that matter longer) than the optical resolution of the associated optical system. In other words, while the broad and general overall concept of super resolution may be present to some limited extent in Tominaga et al disclosure, the Tominaga et al disclosure nevertheless is clearly totally insufficient to teach, disclose or suggest whether its results are achievable with pits that are shorter and/or longer than the optical resolution of the associated optical system because none of those quantitative measurements is contained in the Tominaga et al disclosure. Thus, the Tominaga et al disclosure is insufficient to teach or disclose to one of ordinary skill in the art what the lengths of the pits should be in order to achieve “super resolution”.

On the other hand, Applicants respectfully call attention to the fact that the present invention teaches unequivocally and specifically that the pit length should be shorter than the optical resolution of the associated optical system when “super resolution” is achieved.

The Examiner in the currently outstanding Official Action has determined that the arrangements according to the independent claims of the present application can be obtained by combining cited references Tominaga and Jung. However, Applicants respectfully submit that this determination is obviously wrong for the reasons explained below.

The Examiner has acknowledged that Tominaga discloses a super-resolution optical information recording medium having pits to which light is incident from the substrate side. The Examiner also has asserted that the cited reference Jung reference discloses an optical information recording medium having

lands (or pits) on the light-incident surface of the substrate. Applicants disagree. As far as Applicants are aware, the Jung reference teaches, discloses and/or suggests no such thing.

Rather, the Jung reference discloses an optical data recording medium wherein the recording layer is the light incident surface and the reproducing layer is provided to face the light incident surface. Despite the Examiner's protestations to the contrary, however, nothing in the Jung reference teaches, discloses or suggests the potential possibility of replacing the change material of Jung with lands and pits. The latter is instead an exercise in hindsight reasoning by the Examiner wherein he recreates the features of the claims from isolated (and in fact non-existent) portions of the prior art based upon the teachings of the present specification.

In any event, the Examiner appears to assume that the conventional disc described in (Example 1) of the present application would correspond to the arrangement disclosed in the cited reference Tominaga. If this postulation of the Examiner was correct, the arrangements according to the independent claims of the present application could be theoretically obtained by applying the arrangement of Jung to the conventional disc, but only assuming that one could overcome the hindsight reasoning problem just mentioned.

However, the arrangements according to the independent claims of the present application could not be obtained even if a person skilled in the art could properly apply the arrangement of Jung as modified to utilize pits and lands to the conventional disc above. The reasons for this are as follows:

In the actual manufacturing of a substrate, a person of ordinary skill in the art at the time that the present invention was made would form pits on the substrate according to the super-resolution property of a recording medium including the substrate. In the case of the conventional disc as referred to hereinabove, this would mean that pits having a relatively long pit length must be formed in accordance with Fig. 5 of the present application.



As a concrete example of the foregoing, assume a setting condition requiring a C/N value of 40dB or higher. In this case, a pit length for the conventional disc just mentioned must be set to approximately 0.2  $\mu\text{m}$  or longer in accordance with Fig. 5 of the present application. As shown in Fig. 5, this pit length is longer than the resolution limit (approximately 0.16  $\mu\text{m}$ ).

Furthermore, even if the above-postulated arrangement of Jung (i.e., an arrangement in which a recording medium has lands (or pits) on the light-incident surface of the substrate that Applicants do not believe is taught thereby) would be applied to the conventional disc having a pit length thus determined, conventional arts would not show that such application would make it possible to maintain a high C/N value with a shorter pit length. Therefore, Applicants respectfully submit that a person skilled in the art would never set a pit length shorter than the resolution limit, but would set the pit length as described above directly contrary to the teachings of the present invention. The Examiner has not even attempted to deal with this issue in the currently outstanding Official Action.

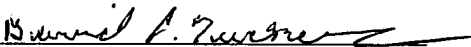
Furthermore, a disc obtained in the foregoing manner would not be one having, as is the case of Example 1 of the present application, a pit length shorter than the resolution limit (i.e., in the case of a C/N value equal to or higher than 40dB, the pit length is approximately 0.14  $\mu\text{m}$  or longer), but rather would be one having the same pit length and storage capacity as those of the conventional disc. Hence, as stated above, the arrangements according to the independent claims of the present application ("pits ... are shorter than a resolution limit ...") could not be obtained by applying the arrangement of Jung to the conventional disc above. Therefore, Applicants respectfully submit that their traverse of the Examiner's currently outstanding rejections is fully and completely supported and the Examiner's currently outstanding rejections/objections to the present application should be withdrawn in response to this submission.

For each and all of the foregoing reasons, entry of the foregoing Amendment, reconsideration and allowance of all of the claims present in this application after the entry of this Amendment in response to this communication are respectfully requested.

Applicant also believes that additional fees beyond those submitted herewith are not required in connection with the consideration of this response to the currently outstanding Official Action. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge and/or credit Deposit Account No. 04-1105, as necessary, for the correct payment of all fees which may be due in connection with the filing and consideration of this communication.

Respectfully submitted,

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SIGNATURE OF PRACTITIONER

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